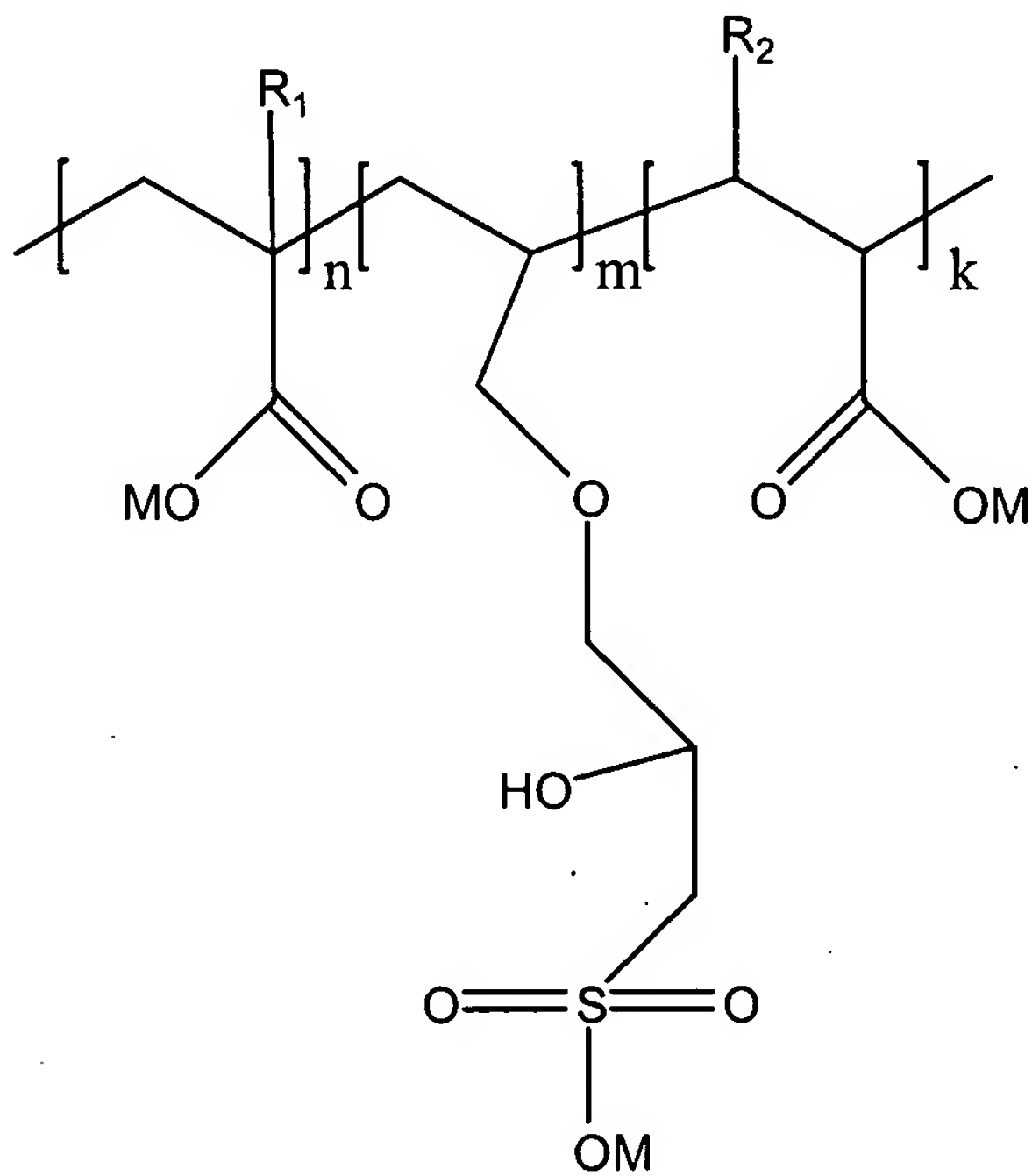


Claims

1. A process for the treatment of a fibre material comprising the step of contacting the fibre material in an aqueous medium with a chelating agent and a polymer having following general formula



wherein

R₁ is a hydrogen atom or an alkyl group containing 1 to 12 carbon atoms,

R₂ is -COOM or -CH₂COOM,

10 M is a hydrogen atom, an alkali metal ion, an alkaline earth metal ion, an ammonium ion or a mixture thereof,

n, m and k are molar ratios of corresponding monomers, wherein n is 0 to 0.95, m is 0.05 to 0.9, and k is 0 to 0.8, and (n+m+k) equals 1, and

the weight average molecular weight is between 500 and 20,000,000 g/mol.

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2. The process according to claim 1 wherein the chelating agent and the polymer are introduced as a mixture or the chelating agent and the polymer are introduced separately.

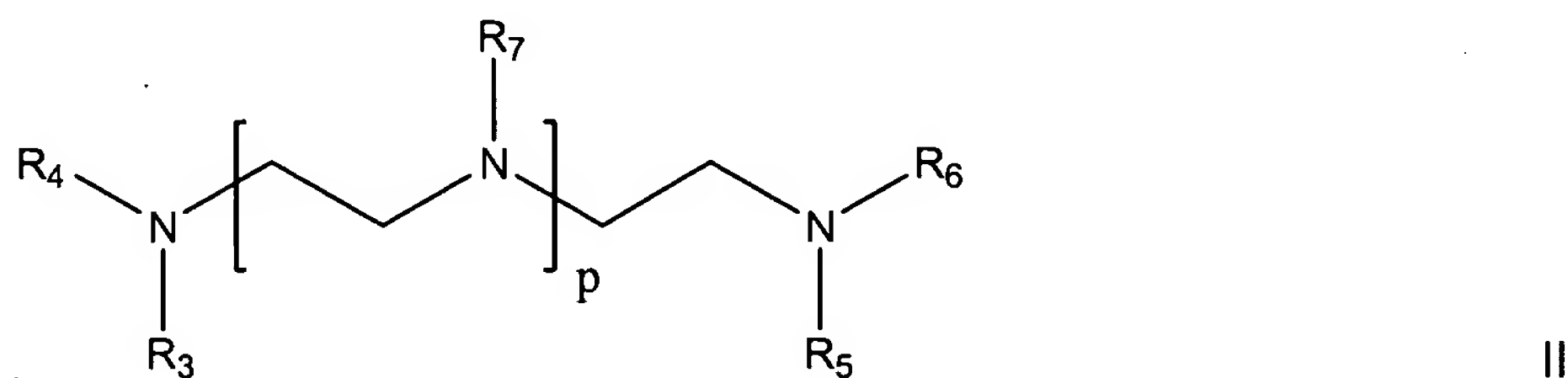
20 3. The process according to claim 1 or 2 wherein the fibre material is a cellulosic fibre material comprising a chemical, mechanical or chemi-mechanical pulp or a recycled fibre material.

4. The process according to any of claims 1 to 3 wherein the treatment comprises bleaching the fibre material with an alkaline peroxide solution in the presence of the chelating agent and the polymer.
- 5 5. The process according to claim 4 wherein the bleaching is preceded by a treatment with a chelating agent.
6. The process according to any of claims 1 to 3 wherein the treatment comprises pretreating the fibre material in the aqueous medium comprising the
10 chelating agent and the polymer.
7. The process according to claim 6 wherein the pH of the aqueous medium in the pretreatment is between 3 and 7, preferably between 4 and 6.5, and more preferably between 4.5 and 6.
15
8. The process according to claim 6 or 7 wherein the pretreatment is followed by a bleaching with a peroxygen compound optionally in the presence of the chelating agent and the polymer.
- 20 9. The process according to claim 8 wherein the peroxygen compound is hydrogen peroxide, peracetic acid or Caro's acid.
10. The process according to claim 1 or 2 wherein the fibre material comprises a recycled fibre material, and wherein the treatment comprises de-inking the
25 recycled fiber material in the aqueous medium comprising the chelating agent and the polymer.
11. The process according to any of claims 1 to 10 wherein in formula I n is 0.4 to 0.9, m is 0.1 to 0.5, and k is 0 to 0.5.
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12. The process according to any of claims 1 to 11 wherein the weight average molecular weight of the copolymer is between 1,000 and 1,000,000 g/mol and preferably between 2,000 g/mol and 500,000 g/mol.
- 35 13. The process according to any of claims 1 to 12 wherein the total amount of the chelating agent and the polymer in the treatment is 0.05 to 10 kg per ton of dry fibre material, preferably 0.1 to 5 kg per ton of dry fibre material, and more preferably 0.2 to 4 kg per ton of dry fibre material.

14. The process according to any of claims 1 to 13 wherein the weight ratio of the polymer to the chelating agent is from 1:4 to 4:1, preferably from 1:3 to 3:1.

5 15. The process according to any of claims 1 to 14 wherein the polymer is a copolymer of 3-allyloxy-2-hydroxypropanesulfonic acid and at least one of the monomers acrylic acid, methacrylic acid, maleic acid and itaconic acid or a salt thereof.

10 16. The process according to any of claims 1 to 15 wherein the chelating agent is a compound having following general formula



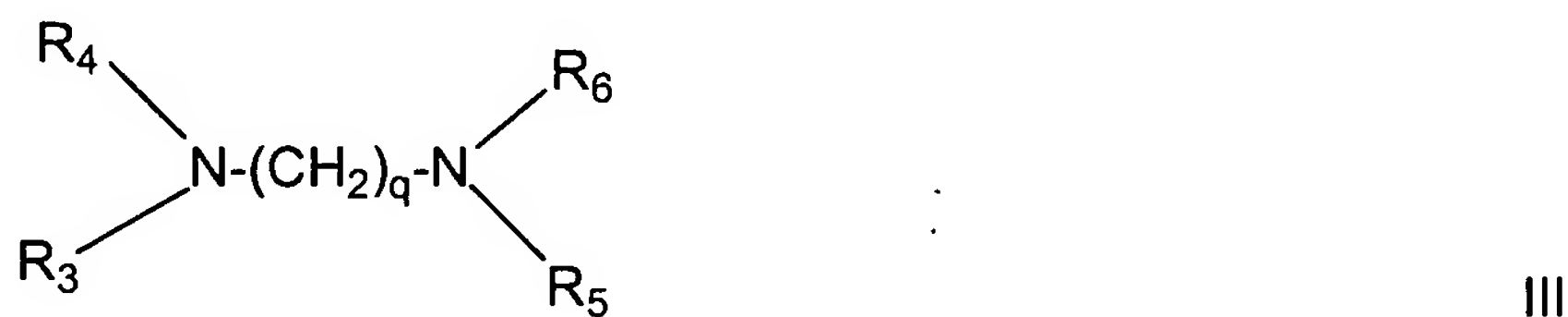
15 wherein

p is 0 or an integer of 1 to 10,

R₃, R₄, R₅, R₆ and R₇ are independently a hydrogen atom or an alkyl chain having 1 to 6 carbon atoms and containing an active chelating ligand, such as a carboxylic, phosphonic or hydroxyl group or a salt thereof.

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17. The process according to any of claims 1 to 15 wherein the chelating agent is a compound having following general formula



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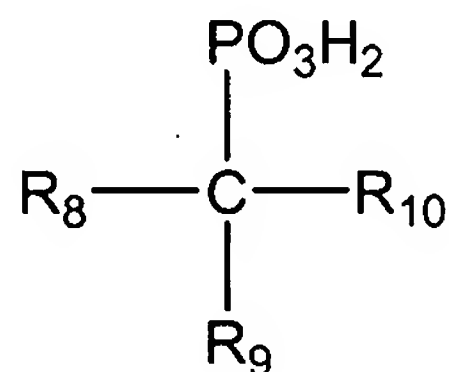
wherein

q is an integer of 3 to 10,

R₃, R₄, R₅ and R₆ are independently a hydrogen atom or an alkyl chain having 1 to 6 carbon atoms and containing an active chelating ligand, such as a carboxylic, phosphonic or hydroxyl group or a salt thereof.

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18. The process according to any of claims 1 to 15 wherein the chelating agent is a compound having following general formula



IV

5 wherein

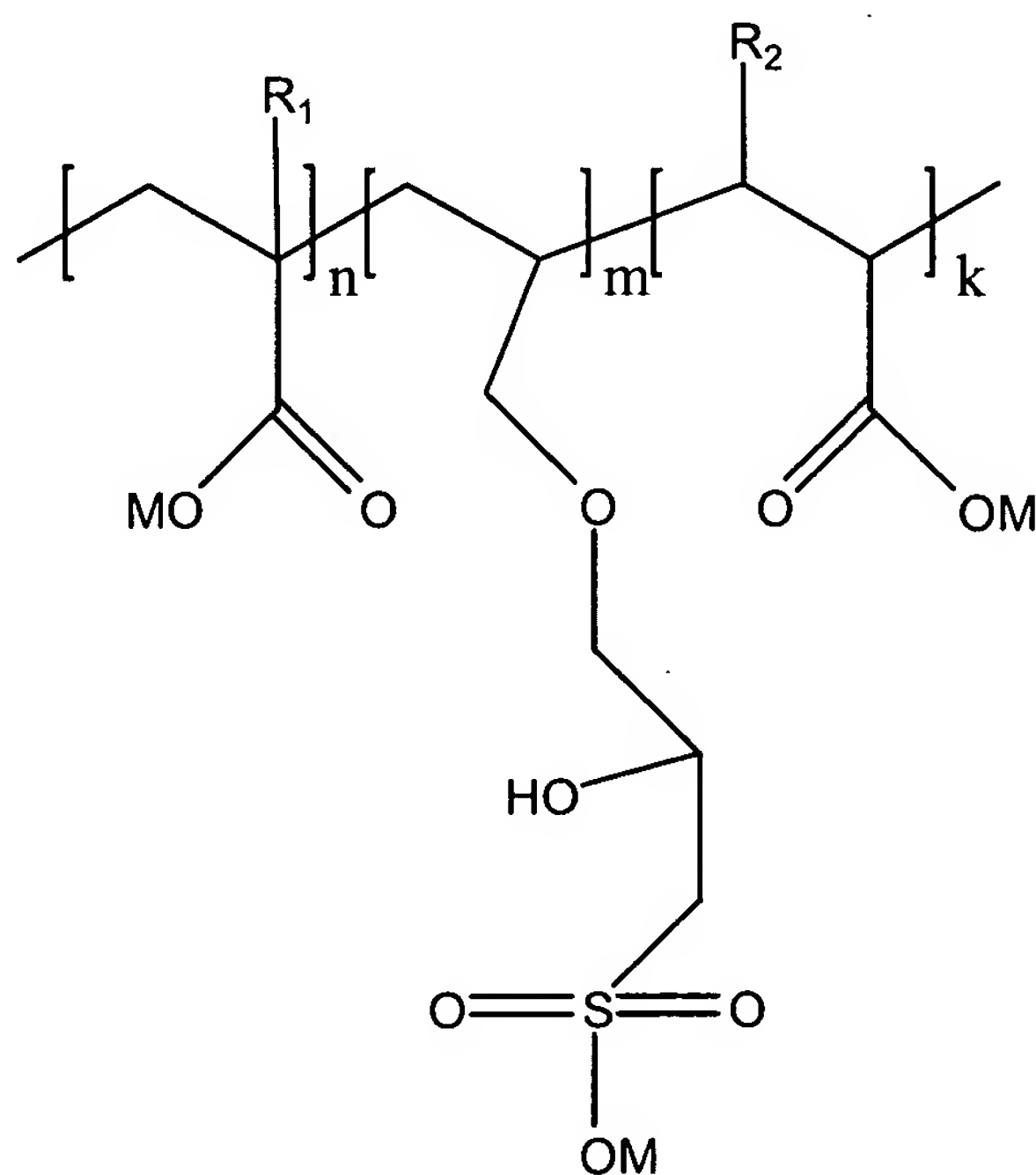
R_8 is a hydrogen atom, an alkyl group containing 1 to 6 carbon atoms or an alkyl chain having 1 to 6 carbon atoms and containing a carboxylic, phosphonic or hydroxyl group,

10 R_9 is a hydrogen atom, hydroxyl group, phosphonic group, carboxylic group or alkyl chain having 1 to 6 carbon atoms and containing one or two carboxylic groups, and

R_{10} is a hydrogen atom, hydroxyl group, carboxylic group, alkyl group containing 1 to 6 carbon atoms or alkyl chain having 1 to 6 carbon atoms and containing a carboxylic group, or a salt thereof.

15

19. A composition comprising a chelating agent and a polymer having following formula



I

wherein

R_1 is a hydrogen atom or an alkyl group containing 1 to 12 carbon atoms,

R_2 is $-\text{COOM}$ or $-\text{CH}_2\text{COOM}$,

M is a hydrogen atom, an alkali metal ion, an alkaline earth metal ion, an ammonium ion or a mixture thereof,

n, m and k are molar ratios of corresponding monomers, wherein n is 0 to 0.95, m is 0.05 to 0.9, and k is 0 to 0.8, and $(n+m+k)$ equals 1, and

the weight average molecular weight is between 500 and 20,000,000 g/mol.

20. The composition according to claim 19 wherein in formula I n is 0.4 to 0.9, m is 0.1 to 0.5, and k is 0 to 0.5.

21. The composition according to claim 19 or 20 wherein the weight average molecular weight of the copolymer is between 1,000 and 1,000,000 g/mol and preferably between 2,000 g/mol and 500,000 g/mol.

22. The composition according to any of claims 19 to 21 wherein the weight ratio of the polymer to the chelating agent is from 1:4 to 4:1, preferably from 1:3 to 3:1.

23. The composition according to any of claims 19 to 22 wherein the polymer is a copolymer of 3-allyloxy-2-hydroxypropanesulfonic acid and at least one of the monomers acrylic acid, methacrylic acid, maleic acid and itaconic acid or a salt thereof.

24. The composition according to any of claims 19 to 23 wherein the chelating agent is as defined in any of claims 16 to 18.

25. Use of a composition according to any of claims 19 to 24 as a stabilizer in bleaching of a fibre material in an aqueous medium.

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26. Use of a composition according to claim 19 to 24 as a stabilizer in deinking of a recycled fibre material.